

CLAIMS

What is claimed is:

1. A method for transmitting a media gateway control command from a media gateway controller to a remote media gateway using a high-level
5 datalink control (HDLC) protocol, the method comprising:
 - (a) generating a media gateway control command;
 - (b) inserting the media gateway control command into a command packet;
 - (c) inserting the command packet into an HDLC frame; and
 - 10 (d) transmitting the HDLC frame to a media gateway using a time division multiplexed (TDM) channel.
2. The method of claim 1 wherein generating a media gateway control command includes generating a MEGAGO command.
3. The method of claim 1 wherein generating a media gateway control
15 command includes generating a media gateway control protocol (MGCP) command.
4. The method of claim 1 wherein inserting the media gateway control command into a command packet includes forming the command packet having a packet header portion and a packet payload portion.
- 20 5. The method of claim 4 wherein forming the command packet includes inserting a command flag in the packet header portion that indicates a type of payload contained in the packet payload portion.
6. The method of claim 5 comprising inserting the media gateway control command into an IP packet and wherein inserting the media gateway

control command into a command packet includes inserting the IP packet in the packet payload portion and inserting a destination interface identifier for the IP packet in the packet header portion.

- 5 7. The method of claim 5 wherein inserting the media gateway control command into the command packet includes inserting the media gateway control command in the packet payload portion and inserting a command identifier in the packet header portion for identifying the media gateway control command.
- 10 8. The method of claim 1 wherein transmitting the HDLC frame to a media gateway using a TDM channel includes transmitting the HDLC frame from a media gateway controller to a media gateway located remotely from the media gateway controller using a TDM channel previously used to carry public switched telephone network (PSTN) data between PSTN switching offices.
- 15 9. The method of claim 8 wherein transmitting the HDLC frame to a media gateway includes transmitting the media gateway control command from a media gateway controller to a media gateway local to the media gateway controller and from the local media gateway to the media gateway located remotely from the media gateway controller.
- 20 10. A media gateway comprising:
 - (a) a plurality of network interfaces for sending and receiving media streams to and from external networks;

- (b) a plurality of voice processing resources operatively associated with the network interfaces for processing the media streams received from the external networks;
 - (c) a command interface for receiving commands from a media gateway controller;
 - (d) a controller operatively associated with the network interfaces and the voice processing resources for controlling the network interfaces and the voice processing resources, the controller being operatively associated with the command interface and being capable of differentiating between commands intended for the media gateway and commands intended for a remote media gateway; and
 - (e) a high-level data link control (HDLC) interface operatively associated with the controller for encapsulating media gateway control commands intended for the remote media gateway in command packets, encapsulating the command packets in HDLC frames, and for forwarding the HDLC frames to the remote media gateway via a time division multiplexed (TDM) channel.
11. The media gateway of claim 10 wherein the plurality of network interfaces include a plurality of TDM network interfaces for sending and receiving data over TDM channels and wherein the HDLC interface is adapted to send the HDLC frames to the TDM network interfaces and the TDM network interfaces are adapted to send the HDLC frames to the remote media gateway via the TDM channels.

12. The media gateway of claim 11 wherein the TDM network interfaces provide redundant access to the TDM channels and wherein the controller is adapted to dynamically switch between TDM channels for sending the HDLC frames to the remote media gateway in response to failure of one of the TDM channels.
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13. The media gateway of claim 10 wherein the plurality of network interfaces include a plurality of packet network interfaces for sending and receiving packetized media streams to and from external networks.
14. The media gateway of claim 10 wherein the HDLC interface is adapted to encapsulate call control commands intended for the remote media gateway in the command packets, to encapsulate the command packets in HDLC frames, and to forward the HDLC frames to the remote media gateway via a TDM channel.
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15. The media gateway of claim 10 wherein the HDLC interface is adapted to encapsulate media gateway maintenance commands intended for the remote media gateway in the command packets, to encapsulate the command packets in HDLC frames, and to forward the HDLC frames to the remote media gateway via a TDM channel.
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16. The media gateway of claim 10 wherein the HDLC interface is adapted to encapsulate network management messages intended for the remote media gateway in the command packets, to encapsulate the command packets in HDLC frames, and to forward the HDLC frames to the remote media gateway via a TDM channel.
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17. The media gateway of claim 10 wherein the HDLC interface is adapted to insert a header in the command packet indicating whether a payload of the command packet carries a network management message, a call control message, or a media gateway maintenance message.
- 5 18. A system for managing a remote media gateway, the system comprising:
- (a) a media gateway controller for generating media gateway control commands;
 - (b) a local media gateway operatively associated with the media
10 gateway controller for sending and receiving media streams to and from external networks;
 - (c) a high-level data link control (HDLC) interface operatively associated with at least one of the media gateway and the media gateway controller for encapsulating media gateway control
15 commands intended for a remote media gateway controller in HDLC frames; and
 - (d) at least one time division multiplexed (TDM) interface operatively associated with the HDLC interface for sending the media gateway control commands to the remote media gateway via a
20 TDM channel.
19. The system of claim 18 wherein the media gateway controller is adapted to generate call control commands intended for the remote media gateway and to forward the call control commands to the remote media gateway via the HDLC interface.

20. The system of claim 18 wherein the media gateway is adapted to generate network management messages intended for the remote media gateway and to forward the network management messages to the remote media gateway via the HDLC interface.
- 5 21. The system of claim 18 wherein the media gateway controller is adapted to generate media gateway maintenance commands intended for the remote media gateway and to forward the media gateway maintenance commands to the remote media gateway via the HDLC interface.
- 10 22. The system of claim 18 wherein the HDLC interface and the TDM interface are located on the media gateway controller.
23. The system of claim 18 wherein the HDLC interface and the TDM interface are located on the media gateway.
24. The system of claim 18 wherein the at least one TDM interface includes
15 a plurality of redundant TDM interfaces for redundantly connecting the media gateway controller to the remote media gateway.
25. The system of claim 24 wherein the plurality of redundant TDM interfaces are connected to the local media gateway and wherein the local media gateway is adapted to detect failure of any one of the TDM
20 interfaces and to switch HDLC frames from the failed interface to any of the other TDM interfaces.
26. The system of claim 24 wherein the plurality of redundant TDM interfaces are connected to the media gateway controller and wherein the media gateway controller is adapted to detect failure of any one of

the TDM interfaces and to switch HDLC frames from the failed interface to any of the other TDM interfaces.

27. The system of claim 18 wherein the HDLC interface is adapted to encapsulate the media gateway control commands in command packets and to encapsulate the command packets in the HDLC frames.
28. The system of claim 27 wherein the HDLC interface is adapted to construct a header for each of the command packets, each header including at least one identifier for indicating a type of media gateway control command included in the command packets.
29. The system of claim 18 wherein the TDM interface is adapted to forward the media gateway control commands to the remote media gateway using a TDM link formerly used to carry data between PSTN switching offices.
30. The system of claim 18 wherein the media gateway controller is adapted to send the media gateway control commands to the local media gateway and wherein the local media gateway is adapted to determine whether the media gateway control commands are addressed to it or to the remote media gateway.
31. The system of claim 30 wherein the local media gateway is adapted to process media gateway control commands that it determines are being addressed to it and to forward the media gateway control commands that it determines are addressed to the remote media gateway.